Attorney Docket: 044182-0308760

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re PATENT APPLICATION of: STROM ET AL.

Application No.: 10/801,944
Filed: March 15, 2004

Confirmation Number: 2939
Examiner: PATEL, Paresh H.
Group Art Unit: 2829

Title: SYSTEM AND METHOD OF MEASURING PROBE FLOAT

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

ATTN: Board of Patent Appeals and Interferences

APPELLANTS' BRIEF (37 C.F.R. §41.37)

Sir:

This paper is further to the Notice of Appeal dated June 14, 2006, for which a supportive brief was due August 14, 2006.

Petition for Extension of Time:

Appellant hereby petitions for a 1-month extension of time, extending the period for filing the Brief from August 14, 2006 until present. The Commissioner is authorized to charge Deposit Account 033975 (order no. 044182-0308760) for the requisite 1-month small-entity extension fee of $60.00.

Other Fees:

The Commissioner is authorized to charge the small entity fee for filing a brief in support of an appeal in the amount of $250.00, and any required fee to Pillsbury Winthrop Shaw Pittman LLP's deposit account no. 033975 (order no. 044182-0308760).

I. REAL PARTY IN INTEREST

The real party in interest in this appeal is the following party: Applied Precision, LLC.

II. RELATED APPEALS AND INTERFERENCES

No other appeals or interferences will directly affect, or be directly affected by, or have a bearing on the Board's decision in the pending appeal.

III. STATUS OF CLAIMS

A. TOTAL NUMBER OF CLAIMS IN APPLICATION

Claims in the application are: **20**

B. STATUS OF ALL THE CLAIMS IN APPLICATION

Claims 1-4, 6-7, 9-13 15-16 and 18-20 are pending in the Application and have been rejected.

Claims 5, 8, 14 and 17 are dependent on a rejected claim but include allowable subject matter.

No claims have been cancelled.

C. CLAIMS ON APPEAL

The rejections of claims 1-4, 6-7, 9-13 15-16 and 18-20 are being appealed.

IV. STATUS OF AMENDMENTS

No amendments to the claims were submitted or made in the Application after the final rejection.

V. SUMMARY OF CLAIMED SUBJECT MATTER

In the present Application, claims 1, 9 and 18 are independent claims. The claims of the present Application are generally directed to calculating probe float. Claim 9 is specifically directed to calculating probe float in a probe card analyzer system. Claim 18 is directed to a computer readable medium encoded with data and instructions for calculating probe float in a probe card analyzer system.

Figure 2 of the present application depicts a vertical probe 133 in a free-hanging state and in a state of electrical contact with a surface. Fig. 2; page 4, lines 29-32. The independent claims require acquiring a free-hanging planarity measurement. Planarity measurements of free hanging probes are measured by optical means because the probes are electrically insulated in the free hanging state. Page 5, lines 8-12. According to the present invention, planarity values are assigned to free-hanging probes newly identified by optical scan. Page 6, lines 3-24.

The independent claims also require obtaining first electrical contact planarity measurement. First electrical contact for each probe 133 generally occurs when the contact surface and surface 135 at the end of guide 134 are relatively positioned at a distance equal to the probe length 136. Figure 2 and page 5, lines 2-7; page 6, lines 25-30.

Finally, each of the independent claims requires the calculation of probe float. Probe float may be calculated for each probe by subtracting the optical (free-hanging) planarity value from the electrical planarity value. Page 7, lines 3-8.

VII. GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

Claims 1-4, 6, 7, 9-13, 15, 16 and 18-20 have been rejected under 35 U.S.C. § 102(e) as being unpatentable over U.S. Patent No. 6,870,382 to Harris ("Harris"). The Office Action objects to claims 5, 8, 14 and 17 as being dependent on rejected independent claims.

At issue in this appeal are the following:

- whether Harris teaches calculating probe float;
- whether Harris teaches acquiring free-hanging planarity measurements;
- whether Harris teaches identifying new free-hanging probes; and
- whether Harris teaches the use of optical systems for planarity measurements.

VIII. ARGUMENT

The rejections of the claims should be reversed because the cited art does not teach or suggest each and every limitation of the claims. A cited prior art reference anticipates a claimed invention under 35 U.S.C. §102 only if every element of the claimed invention is identically shown in the single reference, arranged as they are in the claims. MPEP §2131; *In re Bond*, 910 F.2d 831, 832, 15 USPQ 2d 1566, 1567 (Fed. Cir. 1990). Each and every limitation of the claimed invention is significant and must be found in the single cited prior art reference. *In re Donohue*, 766 F.2d 531, 534, 226 USPQ 619, 621 (Fed. Cir. 1985). As set forth more fully below, Harris does not disclose each and every element of the claims arranged as they are in the claims.

Harris Does Not Teach Calculating Probe Float

Harris does not explicitly or impliedly teach or suggest all of the elements cited in independent claims 1, 9 and 18. The independent claims require calculating probe float using results of acquiring a free-hanging planarity measurement and of obtaining a first electrical contact planarity measurement. Harris is entirely silent regarding probe float calculation. In its sole reference to float, Harris references pin float for the purpose of dismissing optical solutions for planarity measurement as "not feasible in a production environment." Harris col. 5, lines 51-59. Furthermore, Harris explicitly limits itself to evaluating probe tip planarity based solely on measurements of the point of first electrical contact of probe tips. Harris, col. 4, lines 61-64; col. 5, lines 51-59 and col. 6, lines 10-11 and lines 28-48. Harris describes no formula or method for calculation of probe float. Therefore, the Examiner erred in rejecting the independent claims.

Harris Does Not Teach Acquiring Free-Hanging Planarity Measurements

Harris does not explicitly or impliedly teach or suggest all of the elements cited in independent claims 1, 9 and 18. The teachings of Harris are limited to systems that involve mechanical or electrical contact. Harris explicitly limits itself to evaluating probe tip planarity based solely on measurements of the point of first electrical contact of probe tips. Harris, col. 4, lines 61-64; col. 5, lines 51-59 and col. 6, lines 10-11 and lines 28-48. As discussed in the present specification, planarity measurements of free hanging probes must be measured by optical means because probes are electrically insulated in the free hanging state. Page 5, lines 8-12. At most, Harris suggests that optical systems can be used to "report the z positions where

mechanical contact occurs for each probe pin" and is silent regarding planarity measurements for free-hanging probes. Harris, col. 5, lines 51-53. However, Harris states that the point of mechanical contact of probe pins is not a reliable indicator of planarity because "the point of electrical contact (z-location of probe card 32 where electrical continuity exists between a probe needle 50 and a selected surface) typically differs from the point of mechanical contact." Harris, col. 5, lines 32-38, lines 59-67 and col. 6, lines 1-11. Further, Harris deems optical solutions for planarity measurement to be "not feasible in a production environment". Harris col. 5, lines 51-59. Consequently, Harris does not teach free-hanging planarity measurements and Harris provides no implied teaching of acquiring a free-hanging planarity measurement because Harris expressly eschews optical measurements of first mechanical contact.

Therefore, Harris does not explicitly or impliedly teach acquiring free-hanging planarity measurements and the Examiner erred in rejecting the independent claims.

Harris Does Not Teach Identifying New Free-Hanging Probes

Each of claims 3, 12 and 18 require, *inter alia*, identifying new free-hanging probes responsive to providing relative translation between a contact surface and a probe card. Harris does not teach these elements arranged in the manner described. Repetition of selected steps recited in claims 3, 12 and 18 can be expected to increase the number of free-hanging probes as the probes are translated away from a contact surface. Harris provides no equivalent teaching. In contrast, Harris teaches decreasing separation between probe card and wafer chuck, thereby iteratively ***reducing*** the number of free-hanging probes. Harris, col. 6, lines 28-46. Thus, Harris does not include every element of claims 3, 12 and 18 and Harris does not identically show every element of the claimed invention arranged as they are in the claims. Therefore, the rejections of claims 3, 12 and 18 should be withdrawn.

Harris Does Not Teach The Use of Optical Systems For Planarity Measurements

Each of claims 6, 7, 15 and 16 requires the use of an optical system for either acquiring a reference planarity measurement or identifying new free-hanging probes. Harris does not teach the use of an optical system, the acquiring of a reference planarity measurement or the identifying new free-hanging probes. Harris expressly disavows the use of optical solutions for planarity measurement, stating that optical solutions are "not feasible in a production

environment". Harris col. 5, lines 51-59. Additionally, and as shown above regarding claims 3, 12 and 18, Harris teaches a system that progressively reduces free-hanging probes that does not create new free-hanging probes that can be identified using an optical system. Furthermore, Harris is entirely silent on using an optical system to acquire a reference planarity measurement. Therefore, the Examiner erred in rejecting claims 6, 7, 15 and 16.

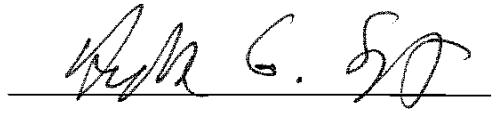
Appellants respectfully submit that the Examiner erred in rejecting the claims and further submit that the rejections should be reversed.

CONCLUSION

For the foregoing reasons, Appellants respectfully request that all the pending claims be deemed allowable by this honorable Board.

Date: SEPTEMBER 14, 2006

PILLSBURY WINTHROP SHAW PITTMAN LLP
11682 El Camino Real, Suite 200
San Diego, CA 92130-2092
Telephone: (858) 509-4007
Facsimile: (858) 509-4010
Customer Number: 27500



Anthony G. Smyth
Registration No. 55,636

CLAIMS APPENDIX

1. (Original) A method of calculating probe float; said method comprising:
acquiring a free-hanging planarity measurement;
obtaining a first electrical contact planarity measurement; and
calculating probe float using results of said acquiring and said obtaining.

2. (Original) The method of claim 1 wherein said calculating comprises computing a difference between results of said obtaining and said acquiring.

3. (Original) The method of claim 1 wherein said acquiring comprises:
acquiring a reference planarity measurement;
providing relative translation between a contact surface and a probe card;
identifying new free-hanging probes responsive to said providing;
assigning a planarity value to newly identified free-hanging probes; and
selectively repeating said providing, said identifying, and said assigning.

4. (Original) The method of claim 3 wherein said selectively repeating further comprises selectively iterating said providing, said identifying, and said assigning until a free-hanging planarity value has been assigned to every probe.

5. (Original) The method of claim 3 wherein said acquiring a reference planarity measurement comprises overtraveling said probe card to a state of last electrical contact.

6. (Original) The method of claim 3 wherein said acquiring a reference planarity measurement comprises utilizing an optical system.

7. (Original) The method of claim 6 wherein said identifying new free-hanging probes comprises utilizing said optical system.

8. (Original) The method of claim 6 wherein said providing relative translation comprises increasing a distance between said contact surface and said probe card of approximately half a depth of field associated with said optical system.

9. (Original) A method of measuring probe float in a probe card analyzer system; said method comprising:
acquiring a free-hanging planarity measurement for a probe in an array on a probe card;

obtaining a first electrical contact planarity measurement for said probe; and

calculating probe float using results of said acquiring and said obtaining.

10. (Original) The method of claim 9 wherein said calculating comprises computing a difference between results of said obtaining and said acquiring.

11. (Original) The method of claim 9 further comprising repeating said acquiring, said obtaining, and said calculating for every probe in said array.

12. (Original) The method of claim 11 wherein said acquiring comprises:

acquiring a reference planarity measurement;

providing relative translation between a contact surface and said probe card;

identifying new free-hanging probes responsive to said providing;

assigning a planarity value to newly identified free-hanging probes; and

selectively repeating said providing, said identifying, and said assigning.

13. (Original) The method of claim 12 wherein said selectively repeating further comprises selectively iterating said providing, said identifying, and said assigning until a free-hanging planarity value has been assigned to every probe in said array.

14. (Original) The method of claim 12 wherein said acquiring a reference planarity measurement comprises overtraveling said probe card to a state of last electrical contact.

15. (Original) The method of claim 12 wherein said acquiring a reference planarity measurement comprises utilizing an optical system.

16. (Original) The method of claim 15 wherein said identifying new free-hanging probes comprises utilizing said optical system.

17. (Original) The method of claim 15 wherein said providing relative translation comprises increasing a distance between said contact surface and said probe card of approximately half a depth of field associated with said optical system.

18. (Original) A computer readable medium encoded with data and instructions for calculating probe float in a probe card analyzer; said data and said instructions causing an apparatus executing said instructions to:

acquire a free-hanging planarity measurement;

obtain a first electrical contact planarity measurement; and

calculate probe float using said free-hanging planarity measurement and said first electrical contact planarity measurement.

19. (Original) The computer readable medium of claim 18 further encoded with data and instructions; said data and said instructions further causing an apparatus executing said instructions to compute a difference between said free-hanging planarity measurement and said first electrical contact planarity measurement.

20. (Original) The computer readable medium of claim 18 further encoded with data and instructions; said data and said instructions further causing an apparatus executing said instructions to calculate probe float for every probe in an array.

APPENDIX: EVIDENCE

None.

APPENDIX: RELATED PROCEEDINGS

None.